

**Seattle Fire Prevention Division**

220 3rd Avenue South  
Seattle, WA 98104  
(206) 385-1450

SFD\_FMO\_SystemsTesting@seattle.gov

**SYSTEM TEST REPORT  
ACCEPTANCE TEST**

Please call the Seattle Radio Shop at 206-386-1213 to arrange to borrow portable radios for the testing and schedule an appointment to confirm signal level received by Radio Shop.

Distributed Antenna Systems (DAS)		COMMISSIONING TEST RESULTS	
		<input type="checkbox"/> Accepted/White Tagged	<input type="checkbox"/> Not Accepted
<b>Occupancy Information (All Fields Mandatory)</b>			
Building Name:		Building Address:	
Contact Name:		Contact Phone:	
Contact Address:		Contact Email:	
Central Station Monitoring: <input type="checkbox"/> Yes <input type="checkbox"/> No		Monitoring Required: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Monitoring Company Name:		Monitoring Company Phone:	
<b>DAS Inventory (All Fields Mandatory)</b>			
System Make		System Model	
Design Firm of Record:		Electrical Permit Application Date:	
Location of System in Building:		Applicable Code & Year (e.g. SFC 2018):	
Is this a hybrid system (shared with cellular phone carriers and/or internal radios?)		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is this an active or a passive system?		<input type="checkbox"/> Active	<input type="checkbox"/> Passive
PSERN Retune Completed? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Antenna Type:			
ERP to Donor Site (dBm): <i>Testing shall be done using a public safety radio held at face level and placed in transmit mode, transmitting within 3' of the antenna predicted to have the lowest loss to the BDA (based on distance from the BDA equipment). The output power of the BDA shall than be measured with a calibrated power meter or spectrum analyzer. Using the measured power, and the estimated feedline loss plus antenna gain, shall be used to calculate the Estimated Radiated Power (ERP).</i>			
Antenna Gain (dBd):			
Antenna Coordinates (NAD83):			
Antenna Azimuth (degrees true) (provided by Seattle IT to Building Owner or Designee in the Request for Authorization):			
Uplink Gain Setting:		Gain Setting:	db
		Power:	dbm
Downlink Gain Setting:		Gain Setting:	db
		Power:	dbm
Signal Level Received at Donor Site (-dBm): <i>The signal level received at the donor site shall be measured by the City of Seattle Communications shop. Call 206-386-1213 at least two days in advance to borrow radios and arrange a testing time. A test signal shall be generated from a public safety radio held at face level and placed in transmit mode, transmitting within 3' of the antenna predicted to have the lowest loss to the BDA (based on distance from the BDA equipment).</i>			
Signal Level Received from Donor Site (-dBm): <i>Measure active control channel, w/20 KHz resolution bandwidth, at the jumper that connects to the DAS head-end donor port.</i>			

Channelized Donor Site Name (provided by Seattle IT to Building Owner or Designee in the Request for Authorization):	
Channelized or Broadband (Note: new <input type="checkbox"/> broadband systems are not allowed in Seattle and will not be accepted on PSERN):	
List of Critical Areas in Building (for coverage testing requirements). Critical areas from NFPA 1221 are: the fire command center(s), the fire pump room(s), interior exit stairways, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas required by the fire code official.	
<b>Testing Company Information (All Fields Mandatory)</b>	
Company Name:	Phone:
Address:	Emergency Phone:
	Email:
<b>Technician/Tester Information (All Fields Mandatory)</b>	
Technician Name:	
Technician FCC Certification/GROL#:	
Technician performing testing has received manufacturer training or other equivalent: <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Specify manufacturer training received and year: Training: _____ Yr: 20_____	
<b>Testing Equipment (All Fields Mandatory)</b>	
Spectrum analyzer make/model**:	
Spectrum analyzer calibration date:	
Calibration performed by firm (qualified firm name):	
<i>** Use of a calibrated spectrum analyzer, with a current calibration, is required for this testing.</i>	
<b>Test Information (Mandatory)</b>	
Date of Test:	
The items on the checklists below shall be inspected and tested. This list does not constitute all of the required inspecting and testing requirements for BDA/DAS. Refer to the CURRENT FIRE CODE AND REFERENCED NFPA STANDARD and the MANUFACTURER'S INSTRUCTIONS for weekly, monthly, and/or quarterly inspecting and testing requirements.	
<b>PRE-TEST CHECKS</b>	
1	A copy of the completed Seattle IT "Request for Authorization: BDA/DAS Installation" form is available in the emergency responder radio system enclosure and an additional copy has been provided to the City of Seattle's Radio System Manager (or the Puget Sound Emergency Radio Network [PSERN] Operator once PSERN has replaced the King County Radio System). <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span>
2	Electrical permit is signed off. <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span>
3	A copy of the following documents is stored in the emergency responder radio system enclosure and/or the building engineer's office, and an additional copy has been provided to the City of Seattle's Radio System Manager (or the Puget Sound Emergency Radio Network [PSERN] Operator once PSERN has replaced the King County Radio System): <div style="margin-left: 20px;"> <div>a. Grid diagram for each floor, showing test signal strengths in each floor, and indicating location of each critical area. Include information on location of fire-resistance-rated pathways. <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span></div> <div>b. A diagram showing location of BDA/DAS control equipment, amplifiers, signal boosters, backup battery systems, and any outdoor antennas, and a wiring schematic. <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span></div> <div>c. Manufacturer specifications for all BDA/DAS systems components including amplifiers, signal boosters, antennas, coax, couplers, splitters, combiners, filters, or any other passive components included. <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span></div> <div>d. Data sheets for the backup battery and charging system (if utilized), and include calculations to ensure the backup power requirements are met. <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span></div> </div>

e.	A certification letter stating that the BDA/DAS has been installed and tested per code and that the system is complete and fully functional.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4	<b>Take precautions to avoid preventable alarms.</b> The Central Station Monitoring Service was notified that DAS testing is occurring and will be generating supervisory signals.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>ACTIVE COMPONENTS</b>			
5	Signal booster is within a NEMA 4, IP66-type waterproof cabinet or equivalent.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6	Battery is within a NEMA 3R, IP65-type waterproof cabinet or equivalent.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7	Equipment is FCC certified. If no, list corrections required.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
8	Active components checked to verify operation within manufacturers' specifications:		
a.	Equipment alarm log checked for recurring or substantial alarms and addressed as per manufacturer's recommendations.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b.	Isolation testing performed and measured system isolation is at least 20 db above the total downlink and the total uplink gain (whichever is greater) between least isolated DAS antenna and the donor antenna.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
c.	Active RF emitting equipment shall have built-in oscillation detection and control circuitry.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
9	Signage at Fire Alarm Panel "This building is equipped with an Emergency Responder Radio Coverage System. Control equipment located in room _____", and signage on or adjacent to the door of the room containing the main system components stating: "Emergency Responder Radio Coverage System Equipment".	<input type="checkbox"/> Yes	<input type="checkbox"/> No
10	Donor antenna(s) are installed in a manner that meets applicable requirements in the International Building Code for weather protection of the building envelope, and are permanently affixed on the highest possible position on the building or where approved by the fire code official, with a sign stating "Movement or repositioning of the antenna is prohibited without approval from the fire code official".	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>DISTRIBUTION SYSTEM AND COVERAGE</b>			
11	Perform in-building coverage test/grid test as required by 2018 Seattle Fire Code Section 510.5.3 using a calibrated spectrum analyzer: Signal strength remains stronger than (less negative than) -95 dBm for 90% of grids on each floor in non-critical areas (for a 20 grid square test, this means that at least 18 of the grids must pass for the floor to pass). If no, location(s) of failed grids:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
12	The list of critical areas to be provided coverage in this building is complete (list is stored with inventory information above). If not correct, go back and update the inventory section of The Compliance Engine, then select Yes.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
13	Critical areas are provided with 99% floor area radio coverage with coverage stronger than -95 dBm. If no, location(s) of critical areas that do not meet threshold:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
14	Perform functional (talk-back) testing in each critical area using one radio in the building and one radio outside the building – radios function sufficiently for communications with a DAQ of 3 or higher? If no, location(s) of non-acceptable communications:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

15	Perform functional (talk-back) testing between each critical area in the building to fire command center, or if no command center, fire alarm control panel – radios function sufficiently for communications with a DAQ of 3 or higher? If no, location(s) of non-acceptable communications:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
16	Perform functional (talk-back) testing between a radio at the fire alarm control panel and a radio at each landing in each stairwell – radios function sufficiently for communications with a DAQ of 3 or higher? If no, location(s) of non-acceptable communications:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
17	Spectrum analyzer or other suitable test equipment has been utilized and confirms that no spurious oscillations are being generated by the subject signal booster.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>BATTERIES/SECONDARY POWER</b>			
18	Backup batteries and secondary power supply tested under load for one hour and meet requirements.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>ALARM PANEL MONITORING</b>			
19	The fire alarm system is supervising the DAS.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
20	The fire alarm panel either (1) separately annunciates the following conditions, or (2) the fire alarm panel has a single DAS supervisory signal annunciating a DAS deficiency with an additional panel at the DAS in the enclosure displays status for all of the following conditions; and, the annunciation was tested and functioning properly:		
a.	Donor antenna malfunction.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b.	Active RF emitting device failure.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
c.	Low battery capacity indication when 70% of 12-hour operating capacity has been depleted.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
d.	System component failure.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
e.	Loss of normal AC power.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
f.	Failure of battery charger.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
21	Communications link between the fire alarm system and the two-way radio communications enhancement system is monitored for integrity.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
22	A supervisory signal was received at Central Station Monitoring company.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>FINAL CHECKS</b>			
23	If building includes a fire alarm system, inform alarm monitoring company that testing is complete.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

**SIGNATURES AND REPORTING**

- 24 A current red, yellow or white tag was placed on the system indicating the system's status and test date consistent with my inspection today and SFD Administrative Rule 9.02. ☐ Yes ☐ No
- The color of the tag is: ☐ Red ☐ Yellow ☐ White
- 25 I will provide a copy of the confidence test report to the owner. ☐ Yes ☐ No
- 26 I will submit this test report within seven days of the date of the test to the fire department through TCE. ☐ Yes ☐ No

By accepting this statement I, the certified technician shown on this form, certify that this fire protection system(s) has been properly inspected for functional operation in accordance with the current Fire Code (FC) used by the department that has jurisdiction and NFPA Standards adopted by the FC for this system. Any deficiencies found are noted in the report and have been reported to the building Owner/Manager for corrective action.

☐ I accept.☐ I am authorized to submit this report for the certified technician who has accepted this statement.

(Initials of Employee)

**SIGNATURE (OPTIONAL)**

Signature of Technician

Signature of Building Representative

## **System Testing Reports Must Be Submitted Online**

Submit reports to <http://www.thecomplianceengine.com/>